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with this topic, while in the first part the status of biological paleobotany is outlined. How welcome a new presentation of the geologic history of plants must be to any paleontologist we can conclude from the fact that the only available books on the subject are W. P. SCHIMPER's *Traité de paléontologie végétale* (1869-1874) and Sir J. WILLIAM DAWSON's *Geological history of plants* (1888). Both books are out of date now. BERRY is probably the only living paleobotanist who could give us an exhaustive treatment of our present knowledge of fossil plants, including the Angiosperms, and of their geological distribution. It is to be hoped that his *Sketch* may soon be followed by a fuller treatment of the same subject.

No survey of the latest general treatises on paleobotany would be approximately complete without paying due respect to the concluding volumes of SEWARD's great reference book,⁴ which represents the most exhaustive treatment of our present information on fossil Cryptogams and Gymnosperms. The last two volumes deal with the Pteridosperms, Cycadofilicales, Cordaitales, Cycadophyta, Ginkgoales, Coniferales, and Gnetales, to use SEWARD's own terminology. His book will remain for a long time the standard work on fossil botany and the main reference book for the students of this subject. The author promises in his preface to the fourth volume to publish in an independent volume a general review of the floras of the past, and the energy which allowed him to complete his monumental work after it had been started twenty-one years ago gives hope that he may fulfil his promise in the near future. The fact that neither SCOTT nor SEWARD dared to attack the intricate problems of the fossil Angiosperms shows clearly how much this great plant division is still in need of investigation. The morphological treatment of fossil Pteridophytes and Gymnosperms has lately absorbed the main attention of paleobotanists, to the great detriment of the higher orders. It is very much to be desired that this deficiency should soon be corrected.—A. C. NOÉ.

Botany of Iceland

The first part of the second volume of this publication, under the editorship of ROSENVINGE and WARMING, includes contributions by ØSTRUP⁵, and GALLØE.⁶ ØSTRUP has investigated the fresh-water diatom material of Copenhagen University, which had been assembled by 16 collectors. The list includes 468 species in 40 genera, 55 of the species being described as new. An instructive tabular survey of distribution is given under the two general heads of "universal distribution" and "distribution in the different parts of Iceland." The table shows that 95 per cent of the Icelandic forms occur in the rest of Europe, and about 50 per cent in Asia and America. In the arctic

⁴ SEWARD, A. C., Fossil plants. Vols. III and IV. Cambridge. 1917 and 1919.

⁵ ØSTRUP, ERNST, Fresh-water diatoms from Iceland. pp. 1-98. *pls.* 5. 1920.

⁶ GALLØE, OLAF, The lichen flora and lichen vegetation of Iceland. pp. 101-247. 1920.

regions, Greenland "stands highest," with 41 per cent of the Icelandic forms, but the total number of species in Iceland exceeds that of any other arctic region.

GALLØE presents the lichen flora under six aspects: (1) a list of species (284 species in 55 genera); (2) the means of propagation and dispersal; (3) the "biology" under four categories, bark lichens, epiphyllous lichens, earth lichens, and rock lichens; (4) the classification of the lichens into associations; (5) the vertical distribution of the lichens; and (6) the abundance of lichens in Iceland. The classification into associations is based upon the character of the substratum and of the vascular plants. Iceland is shown to have a lichen vegetation poor in species in proportion to its area. Epiphyllous lichens are entirely lacking in such a climate, and bark lichens are scanty in their occurrence. On the contrary, the conditions for the development of earth and rock lichens are better than in the temperate or tropical regions. It follows that, in spite of the rigorous climate, the soil and rocks show a large number of specimens. The lack of data regarding moss development is regretted, and an effort is made to remedy it by presenting the frequency of occurrence according to the RAUNKIAER method.—J. M. C.

MINOR NOTICES

North American flora.—The fourth part of Volume 7 continues the Aecidiaceae by J. C. ARTHUR, who in collaboration with F. D. FROMME presents *Dicaeoma* on Poaceae, 88 of the 269 species listed in the analytical key being included in the present part, 43 of the names being new combinations. The tangle of synonymy involved in such a group is very impressive.—J. M. C.

NOTES FOR STUDENTS

Taxonomic notes.—BRITTON,⁷ in collaboration with several botanists, has published descriptions of 170 new species of Cuban plants, distributed among many families, and including 10 new genera as follows: *Bembicidium* and *Cānizatesia* in Leguminosae; *Ramsdenia*, *Roigia*, and *Dimorphocladium* in Euphorbiaceae; *Cheilophyllum*, *Silvinula*, *Naiadotherix*, and *Anisantherina* in Scrophulariaceae; and *Cotema* in Bignoniaceae.

WILLIAMS,⁸ in anticipation of publication in the *North American flora*, has presented the results of his study of the Calymperaceae, "partly to allow the illustration of cross-sections of the leaves to be issued with the descriptions." This family of mosses includes only the genera *Syrrhopodon* and *Calymperes*, the former containing 18 species (1 new) and the latter 12 species (3 new).

⁷ BRITTON, N. L., Descriptions of Cuban plants new to science. Mem. Torr. Bot. Club 16:57-118. 1920.

⁸ WILLIAMS, R. S., Calymperaceae of North America. Bull. Torr. Bot. Club 47:367-396. pls. 15-17. 1920.